REMARKS

The present amendment is prepared in accordance with the new revised requirements of 37 C.F.R. § 1.121. A complete listing of all the claims in the application is shown above showing the status of each claim. For current amendments, inserted material is underlined and deleted material has a line therethrough.

Applicants appreciate the thoroughness with which the Examiner has examined the above-identified application. Reconsideration is requested in view of the remarks below.

Applicants note that the request for continued examination under 37 CFR 1.114 has been entered and that Applicants' submission filed on February 3, 2004 has also been entered. Claims 19 and 29-30 have been canceled. Claims 1-18 and 20-28 are pending in the application. Claims 1-24 have now been canceled, and only claims 25-28 are pending in the application.

Claims Rejections 35 USC 112

Claim 28 has been rejected under 35 USC 112, first paragraph, as failing to comply with the written description requirement. The Examiner contends that the claim contains subject matter which was not described in the specification in such a way that as to reasonably convey to one skilled in the relevant art that the inventor at the time the application was filed, has possession of the claimed invention. Specifically, the Examiner contends that the specification as originally filed does not provide support for "the steps of passing the wafer through the second fluid interface such that a protective coating is formed on a surface of the wafer".

Claim 28 is also rejected under 35 USC 112, first paragraph, because the specification while being enabling for the workpiece being cleaned in water and coated with oil for corrosion protection does not reasonably provide enablement for the step of passing the wafer through a second fluid interface such that a protective coating is formed on a surface of the wafer. Specifically, the specification as originally filed is not enabling for "the step of passing the wafer through the second fluid interface such that a protective coating is formed on a surface of the wafer".

It is established law that the claims form part of the specification and the Examiner's attention is directed to original claim 28 which is specifically directed to a method wherein the step of terminating etching of the surface components comprises drawing the workpiece through the first fluid interface to provide a rapid etch stop and further including the step of passing the workpiece through the second fluid interface such that a protective coating is formed on the surface of the workpiece. The only difference between the original claim and the present claim is that the workpiece is now defined as a wafer. A wafer is considered to be a workpiece as demonstrated throughout the specification. For example, on page 1, the paragraph beginning at line 11, it is stated that during industrial workpiece fabrication, e.g., semiconductor wafer processing. It is clear that a wafer is considered to be a workpiece. Accordingly, it is respectfully submitted that claim 28 is properly allowable under 35 USC 112, first paragraph as having adequate support in the specification as originally filed.

Claims 25-28 have been rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which

Applicants regard as the invention. Specifically, in claim 25,line 2, "layer form a surface" is indefinite and confusing. Claim 25 has been amended to correct the grammatical error.

Claim Rejections 35 USC 103

Claims 1-6, 8-9, 11-18 and 21-24 have been rejected under 35 USC 103(a) as unpatentable over Berbel (U.S. Patent No. 5,989,354) or Matthews (U.S. Patent No. 5,911,837).

These claims have been canceled and it is respectfully that this rejection is now moot.

Claims 7, 10, 20 and 25-28 have been rejected under 35 USC 103(a) as being unpatentable over Berbel or Matthews as applied above, and further in view of Li and Squires et al.

The Examiner acknowledges that Berbel does not teach the etching, the etchant fluid and the agitation as claimed. Matthews does not teach the agitation as claimed.

Li is cited as disclosing a method and compositions for cleaning silicon wafers in a two-phase liquid system. Citing the Abstract, Li teaches the etchant, the at least two fluids of different densities, using the nonpolar organic liquids, citing col. 3, lines 10-67 an cols. 4-6 and the claims. The Examiner concludes it would have been obvious to one skilled in the art to use the etchant and the etchant steps taught by Li in the process taught by Berbel or Matthews to obtain the claimed process. The Examiner justifies such a conclusion because it is well known in the art to use an etchant to remove contaminants from the surface of an article and since Matthews teaches that his invention can be used in the wet etch/clean steps of wafer fabrication, one skilled in the art would use the etching taught by

Li in the Matthews process. For the step of terminating etching of the wafer when the wafer is passed through the fluid interface into at least one fluid immiscible with the etchant fluid, the Examiner concludes it is expected that one skilled in the art would obtain this result by lifting the wafer from the etching fluid. The etching fluid as claimed in claims 25-28 is considered by the Examiner as including water or any fluid used in etching a substrate as it is well known that water can be used for etching the wafer.

Squires et al. teach a method for stripping an organic coating from substrates. The reference teaches the two-phase fluids, and the agitation as claimed. The Examiner concludes It would have been obvious to one of ordinary skill to use the agitation taught by Squires et al. in the process taught by Berber or Matthews to improve the removing process. This is because using the agitation will enhance the cleaning or removing process.

As can be seen from the above, Applicants have canceled all the claims in the application except for claims 25-28 which are directed to a method of etching a layer from the surface of a wafer, wherein the wafer is positioned in an etchant fluid to facilitate etching of a layer on the wafer and then the etching is terminated when the wafer is passed through a fluid interface into at least one fluid immiscible with the etching fluid. This stops the etching process and has been found to be a very effective method for etching a wafer. It is respectfully submitted that such a method is not shown nor taught by the prior art.

Firstly, it is respectfully submitted that neither Berbel nor Matthews refers to the etching of wafers and this is acknowledged by the Examiner. Li is cited as teaching an

etchant and at least two fluids with different densities and the Examiner is attempting to combine this reference with the Berbel and Matthews references, which have nothing to do with etching, to teach Applicants' invention.

Applicants acknowledge that etchants are known to remove layers from the surface of a wafer but this is where any connection with Applicants' invention ends.

Berbel is specifically directed to a drying process which uses two (2) fluids where the object passes through the two fluids and is then dried. This is not Applicants' invention which is an etching process.

Regarding Matthews, the Examiner is apparently relying on the statement in Matthews at column 1, the paragraph beginning at line 12, that the invention relates to semiconductor manufacturing and involves an improved process for removing organic materials from wafers during the wet etch/clean step of wafer fabrication. At line 21, another object of the invention relates to a process for the solvent drying of the surfaces of objects such as semiconductor wafers after wet processing. Applicants respectfully submit the Examiner is technically misinterpreting the teaching of the Matthews reference as equating the process taught by the wet etch/clean step of Matthews and the solvent drying method of Matthews. There is no question that semiconductor wafer fabrication includes a number of steps and that each step is separate. In Applicants' process, Applicants are specifically claiming the etch step of the fabrication process and not a drying step.

In all the objects of the Matthews patent as outlined starting at col. 5, the paragraph beginning at line 14, a drying process is disclosed. In the Summary Of The Invention, also at col. 5, the paragraph beginning at line 41, the foregoing objects (dryings) are achieved

by a chemical solvent drying process of one or more wafers submerged in an aqueous rinsing bath with an upper organic layer so that the wafer which is entirely submerged in the lower aqueous bath is lifted up from the lower aqueous bath through the upper organic layer and evaporation drying the wafer. There is, of course, no disclosure of etching in this drying process.

With regard to the disclosure in Matthews of a wet etch/clean process, it should be appreciated that Matthews discovered that ozone diffused through a subambient deionized water solution will quickly and effectively remove organic materials such as photoresist from wafers without the use of other chemicals. See col. 6, the paragraph beginning at line 10. The Matthews invention relates to a number of ways to diffuse the ozone in the water to sufficiently oxidize organic material on a wafer surface. There is no disclosure in this process to use two (2) immiscible liquid phases to perform an etching process. The Matthews process is merely a method of positioning a wafer in water and diffusing ozone in the water to remove organic material on the wafer. This is not a disclosure or teaching of Applications process.

Also in Matthews starting at col. 12, the paragraph beginning at line 20, the Matthews invention directed to wafer drying is disclosed. Again, this has no relation to etching.

As Applicants read the rejections, it is Applicants' understanding that the Examiner is attempting to tie in the ozone etching step of Matthews with the drying step of Matthews and concludes that Matthews teaches etching using two immiscible phases in which the wafer is immersed in an etchant and the etchant process stopped by passing the wafer from

the etchant fluid to the other immiscible fluid. This is not disclosed nor taught in Matthews.

With regard to Li, Li discloses a method and composition for cleaning oxides and metals on surfaces of silicone wafers in a two-phase liquid system. As acknowledged by the Examiner, Li does not teach passing the article though at least one fluid interface claimed by Applicants, and a silicone wafer is merely maintained in the upper non-polar organic liquid etching phase and metal ions are transported from the surface of the silicone wafers in the organic top layers to the polar bottom layer by diffusion. There is no movement of the wafer between the phase interface of Li. This is an important feature of Applicants' invention which is not shown in Li.

Similarly, Squires et al. is directed to a di-phase stripping bath but the patent requires that it is essential to maintain good dispersion of the solvent phase and the aqueous phase during the time the coated substrate is in contact with the stripping bath. There is no two-phase bath containing an etchant wherein the wafer is immersed in the etchant fluid and the etching process stopped by passing the wafer from the etching fluid to the immiscible fluid.

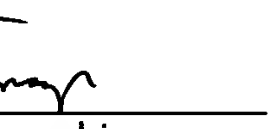
Regarding Li, it is respectfully submitted that Li actually teaches away from Applicants' invention because there is no movement of the wafer between layers.

In summary, Applicants respectfully submit that Applicants' method is different and distinct from that taught by the references. Berbel is specifically directed to a drying process and has no disclosure with regard to etchants at all. Matthews is directed to two (2) inventions, one of which is an "etching" process which does not use two phases as in

Applicants' invention but merely places the wafer in water and diffuses ozone into the water layer. In a separate aspect of the invention, drying of a wafer during fabrication is accomplished by passing the wafer from one phase into a drying liquid phase from which the wafer is removed and the drying liquid removed by evaporation. Li does not show any movement between layers. Squires et al. requires agitation during the stripping process which is opposite to Applicants' invention of having two phases present by which the wafer is passed from one phase to the other. In view of the above, it is respectfully submitted that Applicants' invention is allowable over these references and further and favorable action is respectfully solicited.

It is respectfully submitted that the application has now been brought into a condition where allowance of the case is proper. Reconsideration and issuance of a Notice of Allowance are respectfully solicited. Should the Examiner not find the claims to be allowable, Applicants' attorney respectfully requests that the Examiner call the undersigned to clarify any issue and/or to place the case in condition for allowance.

Respectfully submitted,



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